SIMPLIFIED NUTRITIONAL APPETITE QUESTIONNAIRE (SNAQ) FOR CARDIOPULMONARY AND METABOLIC REHABILITATION PROGRAM

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ABSTRACT

This study aimed to translate and validate a Brazilian version of the Simplified Nutritional Appetite Questionnaire (SNAQ), checking its clarity and validity for the participants of the Cardiopulmonary and Metabolic Rehabilitation Program (CPMR). One hundred and forty-six subjects were interviewed: 79 males, mean age of 63 years (±10) and 67 women, mean age of 66 years (±11). Descriptive analysis was presented as mean, standard deviation and frequency. The internal consistency of the scale was assessed using Cronbach's alpha coefficient and factor analysis by the method of extraction of principal components analysis using Kaiser's criteria (eigenvalues > 1). All questions of the instrument showed positive results regarding clarity. The questionnaire items presented factor loadings above 0.40, (ranging from 0.40 to 0.81). Except for the issue related to the amount of daily meals, all others showed high correlation with the total score of the Brazilian version. Regarding the analysis of internal consistency, the result of 0.61 was reached. In conclusion, the Brazilian Version of SNAQ proved to be valid for use in CPMR program participants, thus becoming an important tool in assessing the appetite of the Brazilian population.

Keywords: validation studies, malnutrition, heart diseases, metabolic diseases.

INTRODUCTION

In Brazil as well as worldwide, the cardiovascular diseases (CVD) represent the main cause of incapacity and morbimortality[1,2]. Approximately one third of the total deaths and 65% of the deaths between 30 and 69 years of age occur due to CVD, which are responsible for a great number of hospital submissions and high costs[3].

Patients with heart diseases who present diabetes[4], anxiety[5], depression[5,6] and risk factors such as smoking[7] may present alterations in the nutritional status. The consequences of bad nutrition are related to serious harm to health[8], contributing to increase of morbimortality and making them prone to a series of complications, among which decrease of functional capacity and compromising of the immunological system[9,10].Additionally, these individuals frequently make concomitant use of many drugs which, associated with the aging process, may influence on appetite, taste, digestion, absorption, use of many nutrients and weight loss[11,12].

It is important to focus on the nutritional aspects of individuals submitted to physical exercise programs[13], such as participants of metabolic and cardiopulmonary rehabilitation program (MCRP), who must keep a balanced diet for health maintenance and good physical performance[14].

Early detection and appetite loss treatment may avoid weight loss, improve health and reduce mortality[15]. In this context, in the last 20 years instruments for evaluation of the nutritional risk such as the Malnutrition Universal Screening Tool, the Nutrition Screening Initiative (NSI) and the Risk Evaluation for Eating and Nutrition (SCREEN I and SCREEN II)[16] have been developed. However, these instruments are extensive and include many interdependent nutritional domains. An option for evaluation of the nutritional risk is the Simplified Nutritional Appetite Questionnaire (SNAQ)[15], which has been simpler and of faster application than the other instruments. Recently, the SNAQ has been used in important studies[17-19], including in the cardiology field[20].

Considering the need for appetite evaluation in individuals with CVD and the lack of instruments in Portuguese which are able to fulfill this need, the present study had the aim to translate and validate for the Portuguese language the SNAQ, verifying its clarity and validity for participants of metabolic and cardiopulmonary rehabilitation program (MCRP).

METHODS

It is a descriptive study of transversal cohort with non-probabilistic sample.

Participants

Individuals participants in a MCRP in the South of Brazil composed this study. One hundred and forty-six individuals from both genders participated in the study: 79 (54.1%) men, mean age of 63 years ($\pm$ 10) and 67 (45.9%) women, mean age of 66 years ($\pm$ 11). Table 1 presents the characteristics of the participants in the study.

Table 1. Socioeconomical and clinical characterization.

Characteristics	n (%)
Socioeconomical classification*	
High (A1 and A2)	9 (6.4)
Medium (B1 and B2)	84 (59.6)
Low (C1, C2 and D)	48 (34.0)
Nutritional status**	
Low weight	10 (7.0)
Normal	41 (28.9)
Overweight	36 (25.4)
Obesity	55 (38.7)
Systemic high blood pressure	85 (60.3)
Coronary arterial disease	77 (54.2)
Dislypidemia	24 (16.9)
Cardiac insufficiency	23 (16.2)
Peripheral obstrutive arterial disease	13 (9.2)
Diabetes	13 (9.2)
Smoking	
Never smoked	77 (54.6)
Former smoker	55 (39.0)
Smoker	9 (6.4)
Medication	
Statin	86 (58.9)
Antiplatelet	85 (58.2)
Beta-blocker	56 (38.4)
Diuretic	53 (36.3)
Calcium channels blocker	33 (22.6)
Angiotensin-converting-enzyme-inhibitor	33 (22.6)
Antidiabetic	32 (21.9)
Nitrates	25 (17.1)
Digitalic drug	11 (7.5)

*Brazilian Association of Research Companies (ABEP, 2012)[21], ** World Health Organization (WHO, 2000)[22] and Pan-American Health Organization (PAHO, 2001)[23].

INSTRUMENTS

Clinical and sociodemographic characterization

A questionnaire semi structured with questions which approached aspects related to aspects of cardiovascular risks (HAS/diabetes/hypercholesterolemia/obesity/smoking) and the medical diagnosis was initially used.

The Standard Criterion of Economical Classification Brazil/2008 of the Brazilian Association of the Research Companies was used for socioeconomical classification[21].Tis questionnaire evaluates existing items in the participant's household and the educational level of the family head. The questionnaire presents high relation with family income (r = 0.78 and r^2 = 62%).

Nutritional status

Nutritional status was verified through the body mass index (BMI), which was obtained by the body mass and stature ratio to the square (kg/m^2)[24]. Nutritional status of the individuals up to 60 years old was classified with the use of the reference values proposed by the World Health Organization[22] and for patients older than 60 years the reference values adopted were the ones proposed by the Pan-American Health Organization[23].

Simplified Nutritional Appetite Questionnaire (SNAQ)

The Simplified Nutritional Appetite Questionnaire (SNAQ) is the short version of the Council of Nutrition Appetite Questionnaire (CNAQ). The validation study of the questionnaires[15] indicated that

due to its short nature and reliability, the SNAQ is more recommended for clinical use.

The SNAQ is composed of four items, grouped in a dingle domain. Each question presents five options for answer which are represented by the letters from A to E. The questions are punctuated based on the following scale: A = 1, B = 2, C = 3, D = 4 and E = 5. When summed up, they give the total score of the questionnaire, which may range from 4 to 20. The lower it is, the higher the risk for weight loss. In the original instrument, indices lower or equal to 14 indicate risk for loss of at least 5% of weight in six months.

Procedures

After explanation about the aims of the study, all participants signed the Free and Clarified Consent Form approved by the Ethics in Research Committee (legal opinion 149/2011), according to the resolution 196/96 of the National Health Board. The researchers set a time which best fit to the participants' routine. The collection was careful so that no external interferences would occur and each participant was individually evaluated by researchers who act in the MCRP under consideration. The questionnaire was applied as an interview and the application time was of approximately two minutes.

Translation, reverse translation and cultural adaptation

The items of the original version of the SNAQ were initially translated to Portuguese by two Brazilian skilled independent translators who were aware of the aim of the research. The two translations were compared by the translators and the researcher, and in case of divergence, alterations were made to reach a consensus compared with the initial translation.

The translation was then changed to English (back-translation) by two bilingual English teachers, one British and the other American, who did not participate in the previous phase. The two versions were compared with the original instrument in English and the existing discrepancies were analyzed by a team composed of two nutritionists, two physiotherapists, three physical education professors and one cardiologist, all researchers and with experience in the field. The Portuguese questionnaire was rewritten until a consensus for the final version was reached (appendix 1).

STATISTICAL ANALYSIS

The data were analyzed in the Statistical Package for the Social Sciences – SPSS® package, version 18.0 for Windows®. The descriptive analysis was presented in mean, standard deviation and frequency.

Clarity

The clarity evaluation of the instrument occurred through scales ranging from 0 to 10, in which 0 corresponded to no clarity and 10 to total clarity. Each one of the four questions of the Brazilian version of the Simplified Nutritional Appetite Questionnaire was evaluated through the scale, and the mean attributed to each question of the instrument was verified.

Factorial analysis

Factorial analysis of the Brazilian version of the SNAQ was performed through analysis extraction method of the main components using the Kaiser criteria (self-values > 1). Minimum load was set at 0.4 so that the question could be part of the factor. Previous

to the factorial analysis, the Bartlett sphericity and Kaiser-Meyer-Olkin (KMO) tests were performed, with the purpose to verify the correlations between the questions of the instrument and the use viability of the factorial analysis.

Inner consistency

In order to verify the inner consistency of the Brazilian version of the SNAQ, the Cronbach alpha coefficient value was obtained. Both analyses of the complete scale and of it with the exclusion of items were performed.

RESULTS

All questions of the Brazilian version of the SNAQ presented positive results concerning its clarity. The mean attributed to questions 1, 2, 3 and 4 were, respectively 9.9, 9.8, 9.8 and 9.9. Only one participant (0.7%) negatively evaluated the clarity of the questions (< 7.0).

The descriptive results of each question of the Brazilian version of the SNAQ as well as the general results of the scale are presented in table 2. It could be seen that questions 3 and 4 did not receive more negative evaluations (1), resulting in higher means compared with questions 1 and 2. Eleven participants presented results lower than 14; that is to say, risk of weight loss.

Intercorrelation of the variables was confirmed ($X^2 = 76.45$; $p < 0.001$), indicating that the data matrix is suitable to carry on with the factorial analysis. The KMO test obtained result of 0.62, which is also considered suitable for performance of factorial analysis.

Factorial analysis evidenced that the questionnaire has only main component, indicating a unifactorial structure. This component explains for 47.0% of the total variation of the instrument (table 3). The items of the questionnaire presented factorial load above 0.40, with variation of 0.40 (question 4) to 0.82 (question 1). Except for question 4, all the other questions presented high correlation with the total score of the Brazilian version of the SNAQ (table 4).

The inner consistency analysis of the Brazilian version of the SNAQ obtained result of 0.61. When items exclusion was performed, it was observed that the highest variations in the sum of the scale and in its variance occurred when question 4 was excluded. The inner consistency tends to reduce when any item is excluded, except for question 4, which leads to more positive results (table 5).

DISCUSSION

The present study demonstrated that there was not difficulty in application of the Brazilian version of the Simplified Nutritional Appetite Questionnaire and in its understanding by the patients, which demonstrates its applicability and clarity.

The questionnaire items presented factorial load higher than 0.40. Except for question 4, all the remaining questions presented high correlation with the total score of the Brazilian version of the SNAQ. The results of the factorial analysis concerning questions 1 and 3 presented values higher than the ones obtained by Wilson et al.[15] in the original validation of the questionnaire. The inner consistency obtained with the Brazilian version of the SNAQ (0.61) is lower than the one presented by the original version of the instrument (0.70); however, since it is an instrument with few questions, this result may be considered sufficient. It is suggested that the questions of the Brazilian version of the SNAQ receive a punctuation, just

Table 2. Descriptive results of each question and general of the Simplified Nutritional Appetite Questionnaire (SNAQ).

Questions	Min.	Max.	Mean	SD
1	1	5	4.02	0.91
2	1	5	3.90	0.97
3	2	5	4.31	0.77
4	2	5	4.66	0.61
Total score	8	20	16.89	2.24

Table 3. Self-values and explained variance of the components of the Simplified Nutritional Appetite Questionnaire (SNAQ).

Component	Initial self-values		
	Total	Variance %	Cumulative %
1	1.882	47.05	47.05
2	0.972	24.31	71.36
3	0.702	17.56	88.92
4	0.443	11.09	100.00

Extraction method: analysis of the main components.

Table 4. Factorial loads for the main component and total item correlation of the Simplified Nutritional Appetite Questionnaire (SNAQ).

Questions	Component 1	Total item correlation
1	0.82	0.790**
2	0.64	0.702**
3	0.80	0.745**
4	0.40	0.440**

**Significant correlation with level $p < 0.01$.

Table 5. Sum, variance and Cronbach alpha of the Simplified Nutritional Appetite Questionnaire (SNAQ) when items are excluded.

Questions	Sum of the scale if the itme is excluded	Variance of the scale if the item is excluded	Cronbach alpha if the item is excluded
1	-23.80%	2.63	0.41
2	-23.09%	2.92	0.58
3	-25.52%	3.06	0.45
4	-27.59%	4.20	0.65

like the versions from other countries, keeping the interpretation of the original version; that is to say, the lower the total score, the higher the weight loss risk, with indices lower or equal 14 indicating risk of loss of at least 5% of weight in six months. However, it is imperative that research using the translated questionnaire are followed by evidence in the Brazilian population, some action will be taken after the validation of the present study.

The SNAQ was developed by the Council for Nutritional Strategies in Long-Term Care for evaluation of the appetite loss in adult and elderly patients and is well-correlated with the gold standard instrument for nutritional evaluation, the Mini-Nutritional Assessment (MNA). The use of this questionnaire is important as initial evaluation of routine and facilitates in an occasional nutritional

intervention[25], being relevant to the monitoring of the individuals in nursing homes, patients admitted to hospitals[19] or during health intervention in community programs[26]. It is recommended that it can occur in the systematic evaluation of MCRP participants.

The use of this instrument is important since appetite loss and its consequent weight loss are frequent conditions and constitute important events in adult and elderly individuals[15,27,28], which requires simple procedures to identify alterations in the nutritional status[29].

The Brazilian version of the SNAQ was clear and valid to be used in MCRP participants. Having the presented translation and factorial validation as starting points, further studies are encouraged with the aim to verify their sensitivity and specificity for indication of nutritional risk.

All authors have declared there is not any potential conflict of interests concerning this article.

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Data:

Nome: Sexo: masculino ( )   feminino ( )
Idade: Peso: Altura:

Instrução de administração. Pedir para o sujeito completar o questionário circulando a resposta correta e depois informar os resultados baseados na seguinte escala numérica: a=1, b=2, c=3, d=4, e=5. A soma dos resultados de cada item constitui o escore QNSA.

Escore QNSA $\leq$ 14 indica risco significativo de pelo menos 5% de perda de peso nos últimos 6 meses.

1) Meu apetite está:
a) Ruim
b) Muito ruim
c) Moderado
d) Bom
e) Muito bom

2) Quando eu como:
a) Sinto-me satisfeito após comer poucas garfadas/colheradas
b) Sinto-me satisfeito após comer aproximadamente 1/3 da refeição
c) Sinto-me satisfeito após comer mais da metade da refeição
d) Sinto-me satisfeito após comer a maior parte da refeição
e) Dificilmente sinto-me satisfeito

3) O sabor da comida parece:
a) Muito ruim
b) Ruim
c) Mediano
d) Bom
e) Muito bom

4) Normalmente eu como:
a) Menos de uma refeição por dia
b) Uma refeição por dia
c) Duas refeições por dia
d) Três refeições por dia
e) Mais de três refeições por dia